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Feasibility Study CDHS (Comprehensive Data Handling System) Two-Year Program Plan

Systems Research and Development Corp.
Research Triangle Park, NC

Prepared for

Environmental Protection Agency
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A FEASIBILITY STUDY CDHS TWO-YEAR PROGRAM PLAN

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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16. ABSTRACT

This report analyzes the effectiveness of the total Comprehensive Data Handling System (CDHS) in achieving its stated goal of aiding the states in reporting their collected air quality and emissions data. This study was accomplished by analysis of the functional useage of CDHS by the state and regional office users, interviewing the management of CDHS, and by interviewing the state and regional office users.

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A FEASIBILITY STUDY
CDHS TWO-YEAR PROGRAM PLAN

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I. INTRODUCTION

1.1 Background of the Comprehensive Data Handling System (CDHS)

The Environmental Protection Agency (EPA) as part of its overall mission to monitor and regulate the level of pollution in the environment, has promulgated regulations pertaining to the quality of the air in the continental United States and its territorial possessions. The Clean Air Act of 1970 requires that EPA request data from each state agency pertaining to air quality as measured at monitoring stations throughout their respective areas as well as emission inventory data. These data are to be processed and reported to the respective regional offices of EPA. Regional offices then process these data and transmit them to EPA in Durham, North Carolina, where they are added to the National Air Data Bank files. The NADB receives these data and updates the data bases which contain all of the raw data for the entire nation and its territorial possessions.

Upon the implementation of this reporting and storage requirement, EPA quickly realized that the voluminous data collected by each individual state would be more easily processed and reported if a uniform, automated system were devised to aid the states in their reporting requirements. To this end, an automated data processing system entitled 'The Comprehensive Data Handling System' (CDHS) was provided in 1972 to the state agencies to try to alleviate much of the manual labor required in processing and reporting the necessary ambient air and emissions data.

In its original form CDHS encompassed a single subsystem called 'Enforcement Management System' (EMS). This subsystem allowed the user agencies to collect, process, track and report data pertaining to the agency enforcement activities. Responsibility for the EMS was later assumed by the Division of Stationary Source Enforcement as no resources were available in OAQPS to support enforcement activities. Therefore, EMS is no longer a part of CDHS.

The second CDHS subsystem was the 'Emissions Inventory Subsystem' (EIS) which was designed to allow users to process their own emissions inventories data. EIS was later expanded to the 'Emissions Inventory Subsystem/Permits and Registration' (EIS/P&R) to provide users with new flexibilities.

To facilitate the users ambient air data processing, the original 'Air Quality Data Handling Subsystem' (AQDHS) was acquired from another branch of EPA. This subsystem has since been improved upon and replaced by a more refined subsystem which has been designated as AQDHS-II.

Over a period of years CDHS has evolved and matured to a point

where the bulk of the resources required for the maintenance of the system falls primarily into the area of user support. This situation is not one that is totally unexpected. It is fairly well accepted that as systems mature, the majority of the resources required for the continuous maintenance and support of the systems fall not into the area of developmental cost but rather in the area of user support.

Both CDHS subsystems - AQDHS-II and EIS/P&R - were developed in COBOL. Originally, NADB provided subsystem update support only on IBM hardware. Users with non-IBM equipment were responsible for JCL conversion and for making any program changes dictated by their specific hardware. Because of a marked increase in the number of UNIVAC users, the National Air Data Branch (NADB) expanded its update support to encompass the UNIVAC systems. Plans are under way to provide this same support on both CDC and Honeywell equipment.

Historically, the funding required for user support has been broken down into two basic portions. The first portion, system enhancements, is concerned with the alteration of the existing system to conform to user and EPA expanded needs. The second portion is user education and training.

Education and training in CDHS are currently provided through workshops and user manuals. These workshops, provided by the Air Pollution Training Institute - (APTI), better acquaint current users with the subsystem components and introduce new user groups to the functions and capabilities of the system.

The workshops and training seminars are invaluable not only from the standpoint of the state agencies and their personnel, but also from the standpoint of EPA, which reaps benefits through increased contact with the state and local agencies using CDHS.

As a supplement to the workshops, a comprehensive series of documentation packages aid those personnel using and implementing the program components of CDHS.

In order to develop a comprehensive program for support of CDHS, it was necessary to analyze the effectiveness of the total CDHS program in achieving its stated goal of aiding the states in reporting their collected data. This involved 1) the analysis of the functional usage of CDHS by the state and regional office users, 2) interviewing the management of the CDHS system, 3) interviewing the state and regional office users.

Systems Research and Development Corporation (SRD) has taken this approach to accomplish the stated goal of developing a comprehensive two-year program of support and maintenance. However, during the course of the interviews and research, SRD

found that much of the information gathered prompted further research and interviews into areas which were not direct programming support in nature. The resulting collection of data proved to be most useful in the development of the proposed two-year program of support for CDHS.

This report is divided in two basic sections. The first section is a detailed discussion of the components of CDHS which were analyzed and the findings of the analysis are explained. The second section outlines and discusses the proposed two-year program of support based on the findings detailed in the first section.

II. CDHS PROGRAM ANALYSIS

2.1 Analysis of User Support Programs

2.1.1 Documentations

The CDHS is currently documented in two separate manuals. The first is a documentation package for the AQDHS-II subsystem; the second manual addresses the EIS/P&R subsystem. It has been determined that these manuals should remain separate since the subsystems do not merge into one another. However, each one of these manuals encompasses both the user and programmer guide requirements; this, we feel, is not a logical separation of documentation needs. The management of CDHS agrees with this point and is currently proposing that both the AQDHS-II and EIS/P&R documentation manuals be rewritten. The revision of the two will be such that the user and programmer guides will be in separate volumes: i.e., upon revision the CDHS will be explained in two sets of user manuals--one for EIS/P&R and one for AQDHS-II. Also separate system documentation manuals, one for EIS/P&R and one for AQDHS-II, will be provided. We feel that this division is logical. Programmers and users having very little data processing background will, of course, have widely different needs.

2.1.2 CDHS Bulletins

As a further aid in communicating with the user, CDHS publishes and disseminates a bulletin to the various user groups on a bi-monthly basis. This bulletin is a direct communications tool that allows the management of CDHS to disseminate information to the users about proposed changes and enhancements, and also to make each user in the field aware of suggestions made by other users and user problems encountered by others which can be avoided.

2.1.3 User Training/Workshops

The CDHS uses a series of seminars and workshops to educate the user personnel, technical personnel and management staff to the uses, capabilities, and limitations of CDHS.

In the past, these training sessions have been sponsored by the National EPA office for any interested users and by the regional EPA offices for the benefit of state offices under their jurisdiction. To ascertain the effectivess of the training sessions, former participants were interviewed and asked their impressions of the training sessions, and what might be done to improve these training sessions.

In the majority of the cases, the former participants

concurred that the concept of the training sessions was an excellent idea. It was generally felt that such training was an absolute necessity to make their use of CDHS as effective as possible. However, the participants interviewed felt that there were the following shortcomings:

1) participants were not properly screened as to their use of the system

2) student participation through sample problem solving was not encouraged

3) the instructor did not appear to be familiar with the system

4) the course material was not in a readable format

2.1.4 User Meetings

User meetings have been scheduled on a regional basis allowing the state agencies and the regional EPA office to meet and discuss their use of and the shortcomings of CDHS. This means of soliciting new ideas and airing old problems has proven to be an invaluable aid. First, the CDHS management has the opportunity to personally explain to the users those problem areas which are currently known and for which remedies are planned or in progress. Second, the users feel that they are contributing to the overall planning of system enhancements. Third, many valuable new ideas and suggestions are gained.

2.1.5 System Updates

To accomplish the changes which are necessary to the system from time to time, a series of sequential system updates has been used to modify existing programs and add new programs to CDHS. This mechanism allows the CDHS management the flexibility of distributing to the user community all changes which are necessary to remedy those problems identified by the user community. It also enables users to keep their own versions of the baseline system current.

2.2 Analysis of Current Air Quality Data Validation Techniques

As previously stated, the overall intent for the initial design and development of CDHS was to allow the states an effective means of processing and reporting their emissions and ambient air data. The efficient and timely processing of these data can only be as good as the techniques of collecting and validating the data.

The advantages of the data handling and validation techniques incorporated within CDHS are discussed below.

2.2.1 Extensive Range Checking and Cross-Checking of Data

Data collected at the air monitoring stations in the various states are recorded on various types of equipment. The types of devices used for recording air quality data range from monitoring devices which simply record the data to those which both record and prepare the data for initial input and processing by CDHS.

None of the monitoring devices is absolutely fool-proof in its recording. The less automated monitoring devices simply record the data to be transcribed into a form acceptable into CDHS. This transcription opens the possibility of human error. Additionally, due to the tendency of the monitoring devices to become uncalibrated, another area of possible data error arises.

In order to greatly reduce the inherent errors which occur with the aforementioned recording mechanisms, extensive edit checking and field cross-checking has been incorporated into CDHS to insure quality data in the reporting process.

2.2.2 Labor Intensiveness in Insuring Quality Control

The editing and validation techniques of CDHS, though comprehensive, still prove inadequate to detect all of the errors which might occur as a result of an uncalibrated monitoring device or an error in transcription. For this reason the state agencies and regional offices must dedicate a portion of their manpower to manually checking the air quality data for possible errors. This situation requires a labor-intensive quality control group. Unfortunately, several state agencies are unable to dedicate the necessary manpower for this type of manual quality control checking, which has lead to the reporting of erroneous data to NADB.

This situation, though tolerable in the short run, is not acceptable on a long-term basis. It is therefore imperative that a more comprehensive data validation technique be implemented to insure the quality of the data reported to NADB. Such an improved data validation technique would lend some relief to those states which are currently labor intensive in the area of quality control. Additionally, a new level of credibility would be available to the collective air quality data.

2.3 Analysis of Current and Proposed CDHS Programming Projects

Because the CDHS system has been operable for several years, it was expected that the system as a whole would be firmly established as a reliable and sound entity at this point. Analysis of the system as a whole and the component subsystems individually bore out this assumption.

Currently, the system operates without any intolerable problems. Investigation of the current and proposed programming efforts indicate that the efforts which are under way or planned for the current fiscal year are principally enhancements and extensions to the existing system.

2.3.1 Current Programming Efforts

During fiscal year 1977 several programming efforts were initiated to extend the capabilities of CDHS. The more notable of these were as follows:

1) removal of the decimal point indicator from the key field of the AQDHS-II master records

2) extension of the sliding average program to produce violations of standards reports for specified second highest value

3) incorporation of the EPA developed anomaly screening techniques

4) development of a 'QUICK LOOK' program to allow users to selectively retrieve and view individual records on the master file

All of the above-mentioned programming efforts reflect changes which were initiated either directly or indirectly from requests made by the user community or which are required because of changing EPA requirements.

2.3.2 Proposed Programming Projects

The programming efforts proposed for fiscal year 1978 show a marked decrease in the level of actual programming changes. The major resource expenditure is proposed in the area of non-ADP-development activities. The proposed program enhancements again reflect user requests for modifications but additionally reflect the anticipated change in the EPA's reporting requirements.

The proposed programming efforts are as follows:

1) modification of the system to generate State and Local Monitoring System (SLAMS) reports per the revised Standing Air Monitoring Work Group (SAMWG) recommendations

2) development of vendor independent sort routines to insure greater uniformity of the baseline system

3) modification of existing auxiliary file maintenance programs to make them standard file maintenance programs

2.4 Analysis of CDHS Used by State Agencies in Achieving More Rapid Data Flow

The success of CDHS in aiding the states in their processing and reporting requirements can best be evaluated by scrutinizing the most basic intention for CDHS, that is the speedy and accurate reporting of the collected ambient air data.

2.4.1 Historical Data Flow Patterns

Prior to the development of CDHS, the data flow from the states to EPA was very sporadic. Each state agency used its own manual or automated methods in reporting the required air quality data. There was a lag between the collection and reporting of the air quality data, sometimes in excess of eight quarters. This extended period of time from actual collection to reporting of data created some problems in that the data base files were never as current as was needed. Additionally, the data reported by the state agencies lacked the uniformity which was necessary to guarantee a data base of any great integrity. This problem, though most prevalent among those states with no automatic data processing system, still occurred even in those states with data processing capabilities.

2.4.2 Current Data Flow Patterns

When CDHS was first installed, no appreciable change in the data flow was observable because the state agencies had to accustom themselves to the fine points of the system.

In order to determine the effect of CDHS on the timeliness of data reported to the national headquarters, NADB has instituted an on-going study of the amounts of data which are reported by CDHS and non-CDHS users. The purpose, as mentioned, is to determine the timeliness of data being reported by CDHS users versus non-CDHS users. The initial findings of this study were reported to Dr. James Hammerle by Lloyd Hedgepeth on August 3, 1977. The report dealt specifically with data reported by AQDHS-II. The figures of the initial report indicated that AQDHS-II did in fact speed the reporting of data.

This study of the data flow pattern has continued and now reflects statistics on data for AQDHS-II for the first

three quarters of 1977. These statistics are shown in figures 2-1, 2-2, and 2-3 and are current as of January 25, 1978.

REPORTED AMBIENT AIR DATA

QUARTER 1, 1977

AS OF 1-25-78

	TOTAL			NON-AQDHS-II			AQDHS-II		
	Proposed	Reported	Percent	Proposed	Reported	Percent	Proposed	Reported	Percent
TSP	3510	3174	90.4	1970	1526	77.6	1540	1648	107.0
NO2	1005	1087	108.2	516	521	101.0	489	566	115.7
THC	--	25	--	--	13	--	--	12	--
OX	458	176	38.4	268	85	31.7	190	91	47.9
CO	457	171	37.4	293	102	34.8	164	92	56.1
SO2	2130	1715	80.5	1312	841	64.1	818	874	106.8

FIGURE 2-1

REPORTED AMBIENT AIR DATA

QUARTER 2, 1977 AS OF 1-25-78

	TOTAL			NON-AQDHS-II			AQDHS-II		
	Proposed	Reported	Percent	Proposed	Reported	Percent	Proposed	Reported	Percent
TSP	3510	2534	72.2	1970	1279	64.9	1540	1255	81.5
NO2	1005	812	80.8	516	398	77.1	489	414	84.7
THC	--	16	--	--	11	--	--	5	--
OX	458	176	38.4	268	86	32.1	190	90	47.4
CO	457	158	34.6	293	94	32.1	164	64	39.0
SO2	2130	1289	60.5	1312	649	49.5	818	640	78.2

FIGURE 2-2

REPORTED AMBIENT AIR DATA

QUARTER 3, 1977

AS OF 1-25-78

	TOTAL			NON-AQDHS-II			AQDHS-II		
	Proposed	Reported	Percent	Proposed	Reported	Percent	Proposed	Reported	Percent
TSP	3510	1166	33.2	1970	523	26.5	1540	643	41.8
NO2	1005	312	31.0	516	126	24.5	489	186	38.0
THC	--	9	--	--	3	--	--	6	--
OX	458	104	13.8;c	268	85	31.7	190	91	47.9
CO	457	92	20.1	293	49	16.	164	43	26.2
SO2	2130	584	25.7	1312	217	17.9	818	331	40.5

As evidenced by these figures, users of AQDHS-II report a higher percentage of their proposed data than do non-AQDHS users. This trend is observed in each quarter for each pollutant reported and indicates that AQDHS-II was in fact a contributing factor in the timely reporting of the ambient air data. Figures for the EIS/P&R subsystem were not included in these reports; however, its effectiveness is currently being evaluated.

2.4.3 Problems in State Office Usage of CDHS

During the course of this feasibility study, ten state and three regional offices were interviewed to ascertain their feelings about the worth and overall performance of CDHS. In every case, the general impression was favorable. The goal of CDHS has been met in that it offers the state and regional offices a tool for processing and reporting data in a more timely fashion. However, there were several areas in which those people interviewed felt that CDHS fell short of what they expected, not so much from the standpoint of its original design intent, but rather from the standpoint of its usefulness to them as separate organizations.

In one regional office, several users of CDHS expressed concern not about CDHS but rather about the instability of the UNIVAC 1110 system at the National Computing Center which is used to report data received from the state offices. This was seen as a constant source of irritation for those personnel in the regional office.

The states feel that another CDHS shortcoming is the lack of adequate summary reports within each subsystem. There are only three reports available out of the EIS/P&R subsystem. One of these reports is a limited summary. The others are rather detailed reports of point source and area source emissions data within each emission control location. The state agencies interviewed felt that several compact summary reports are needed.

In several states, the detailed list reports amount to several boxes of computer printed information. This volume of information, though valuable, is quite bulky and difficult to handle. The state offices felt that a summarized listing should be available. Such summarized information would then lend itself more readily to quick review and would consequently be more useful to the state agencies in using the data for their own purposes.

2.4.4 Potential for Additional Usage of CDHS by State Installations

During the course of the feasibility study, an attempt was

made to determine what justification or reasons many of the state agencies had for opting not to use CDHS. The majority of those state agencies which were interviewed gave the following reasons:

1. They currently had an air quality reporting system in place and operational and were thoroughly familiar with it. Consequently, they were quite reluctant to change to a totally new and unknown reporting system.

2. Several of the state agencies indicated that for their particular usages, their currently installed reporting system adequately met both their state needs and the reporting requirements of the Federal Government.

3. Additionally, some states indicate that their own self-developed air quality reporting systems were a source of pride in that they were developed and implemented as an entity apart from any Federal assistance.

4. Cost of maintaining the system after installation for some states would prove too cost-prohibitive due to the frequency of the required system updates.

Judging from responses by the state agencies, the ultimate goal of CDHS cannot be achieved without some changes. The CDHS management must therefore expand the capabilities of the CDHS system to the point where it offers the states something more than just a reporting medium to the National Environmental Protection Agency. Such enhancements could then be used as enticements to attract interest in those states which feel that CDHS is nothing more than a reporting tool for EPA.

Those states which have complained about the cost of the CDHS updates have generally been states which have non-IBM computing equipment or states which re-document to their own standards each update documentation package.

2.5 Analysis of CDHS Assistance/Trouble-Shooting Activities

When logic or system errors are encountered by the user community, they must be thoroughly investigated to determine their impact on the system and any previously processed data. Then corrective actions must be taken.

When such situations arise, a support group must be immediately available to answer the calls for assistance. Currently, contractor support is available to answer any such requests for assistance.

2.5.1 Historical Performance Requirements

Typically, responsiveness to user problems has been a function of the availability of qualified manpower to lend assistance to CDHS users. In the past, this availablity has not always been as good as was needed due to manpower limitations.

A remedy to this problem was found in the form of contractor support which furnished a qualified staff of support personnel to assist the users. Over the two-year period in which this form of assistance and trouble-shooting has been used, the performance record has been quite impressive. Research Triangle Institute (RTI), which is the commercial contractor for this effort, has exhibited a high degree of competence and skill in fulfilling the task of aiding the state users in the usage of CDHS. Their efforts have given the user community an added sense of confidence in knowing that capable personnel are available upon request.

2.5.2 Current Performance Requirements

During the current fiscal year, the program for user assistance and trouble-shooting continues much as in the previous fiscal year. However, an added benefit of the user support effort has been the allowance for the contingency of new system modifications which are identified during trouble-shooting activities. The state assistance and trouble-shooting activity is beneficial not only from the standpoint of the users but also from the standpoint of improving the overall system. It is extremely important that this contingency feature be adopted as a standard part of user support to maintain flexibility in making system improvements which can only be identified as a result of troubleshooting.

2.6 Analysis of Contractor Support

The need to expeditiously implement required changes to CDHS is self-evident. For this reason, performance periods are placed on the individual contractors to insure timely delivery of the required software and/or service.

Much of the systems' design, programming and implementation of CDHS has been through contractor support. Those contractors involved in the support effort have generally done an excellent job. The contractors involved most recently in support of CDHS include Research Triangle Institute (RTI), Potomac Research Incorporated (PRI) and The Research Corporation of New England (TRC).

Of the aforementioned contractors, all have performed at a satisfactory level with the exception of Potomac Research Incorporated. In conversations with the management of CDHS,

cases were cited wherein both the quality and timeliness of programming work being done by PRI affected both the CDHS support effort and other contract support efforts. On a major system enhancement effort, the specified delivery date was July 15, 1977. Delivery was not accomplished until September 20, 1977. Even after delivery and inspection of the software, the quality of the software proved unacceptable for incorporation into the system. Changes to this software are therefore necessary before it can be integrated into the system. The cost of these changes is to be borne by the General Services Administration which acted as primary contractor for the effort.

Such situations, though rare, tremendously affect the support and continued goodwill of the user community. The management of CDHS must therefore be conscientious in procuring the services of competent, experienced and dedicated contractors to insure the continued success of CDHS.

2.7 CDHS Current Usage Level

The level of state usage of CDHS is reflected in the following table.

CDHS USER LISTING

Region I	AQDHS-II	EIS/P&R	EQUIPMENT
Conn.	Installed	---	IBM 370
Mass.	In Progress	In Progress	CDC CYBER 72
New Hamp.	Installed	---	Honeywell
Rhode Island	Installed	---	Amdahl 470
Maine	In Progress	---	Honeywell
Region II			
N. Y. City	Installed	---	---
Puerto Rico	Installed	Installed	---
Region III			
Delaware	---	Installed	IBM 360/50
Virginia.	Installed	Installed	IBM 370/158
Fairfax Co., Va.	Installed	Installed	IBM 370/155
Region IV			
Alabama	Installed	Installed	Univac 1100/10
Florida	Installed	---	Univac 1100/40
Georgia	Installed	Installed	IBM 370/158
Kentucky	---	Installed	---
Mississippi	---	Installed	IBM 370/155
N. Carolina	---	Installed	---
S. Carolina	Installed	Installed	---
Tennessee	Installed	Installed	IBM 370

Region V			
Illinois	Installed	Installed	IBM 370/168
Indiana	Installed	Installed	IBM 370/165
Minnesota	---	Installed	CDC 3300
Ohio	Installed	Installed	IBM 370/158
Region VI			
Oklahoma	Installed	---	---
New Mexico	Installed	---	---
Region VII			
Iowa	Installed	---	IBM 370/158
Missouri	Installed	Installed	IBM 370/158
Region VIII			
Colorado	Installed	Installed	IBM 370/145
N. Dakota	Installed	Installed	IBM 370/145
Montana	---	Installed	IBM 370/145
Wyoming	Installed	---	---
Utah	In Progress	---	---
Region IX			
Arizona	---	Installed	IBM 370/145
Calif	Installed	Installed	IBM 370/168
Nevada	Installed	---	Univac 1108
Region X			
Alaska	In Progress	Installed	IBM 370/148
Total Installed	26	21	

III. PROJECT PLAN

3.1 Rationale for the Proposed Two-Year Plan

The primary thrust of this feasibility study is the development of a comprehensive two-year program plan for the on-going support of CDHS. Our initial intent was the development of a plan which was concerned only with programming. However, as a result of information gathered during this study, this plan addresses areas which are not strictly programming functions.

To accomplish the goal of achieving the highest possible level of usage by state air quality agencies, SRD has determined that emphasis must be directed toward providing potential users with a total air quality package -- one that enables the state agencies to report their data to EPA but also one that serves as a tool in state planning and regulation processes. Such a total system would negate several of the states' positions that CDHS is not worthwhile because it is geared toward EPA's needs and not theirs and offers them no more than their own air quality systems. The management of CDHS must therefore determine what enchancements would be most beneficial to the state users and implement them even if such enhancements would not be of direct benefit to EPA. Further effort must then be directed toward informing the state agencies of the expanded advantages and usefulness of CDHS. For current CDHS users, continued support is essential from the standpoint of program enhancement and non-programming support. The following two-year plan is proposed to most effectively accomplish the goals of CDHS.

3.2 First-Year Plan

To provide a comprehensive level of user support and to promote greater state usage of CDHS, the following non-programming activities should be implemented or continued.

A. Emergency troubleshooting including installation assistance

B. Publication of the CDHS Users Bulletin

C. Distribution of subsystem and documentation updates to existing programs

D. Distribution of new programs and associated documentation

E. Distribution of the subsystems on request

F. Maintenance of the following mailing lists:
   1. CDHS Users Bulletin
   2. AQDHS-II Update Distribution List
   3. EIS/P&R Update Distribution List

G. Maintenance of the Update Verification File

H. Maintenance of the User Hardware Configuration File

I. Maintenance of the User Software Library

J. Participation in user group meetings

K. Maintenance of Baseline System and Tape Library

L. User documentation revised to NADB standards with separate users manuals for each of the subsystems.

M. Marketing effort to recruit additional state users

In the area of software enhancements, the following projects are deemed necessary to augment the system for the benefit of the user community as well as EPA.

A. SLAMS Reports -- to conform to revised SAMWG recommendations

B. User summary reports (AQDHS-II) -- develop at least six one-line summary reports to user specifications

C. Standards violation report (AQDHS-II) -- automatic production of exception report whenever a short term or annual standard is violated

D. Vendor Independent Sort Routines (AQDHS-II) -- because of existing problems in some vendors' sort utilities and the need to make the system as vendor independent as possible, at least five sort programs need to be developed

E. User summary reports (EIS/P&R) -- develop summary reports for emissions data: not currently available

F. Transaction Edit (AQDHS-II) -- Provide additional anomaly screening by comparing data with minimum detectable values to generate a non-suppressible warning message

G. Batched Retrievals (EIS/P&R) -- modify current retrieval package to allow multiple retrievals with only one pass of the master file

3.3 Second-Year Plan

The second year plan follows much the same pattern as the first year plan except that documentation will not be a major project since this will have been completed during fiscal year 1978. Non-programming support recommendations are outlined as follows.

A. State assistance and troubleshooting (this project must be expanded as more users are added.)

B. Bi-monthly CDHS USERS BULLETIN

C. User training (workshops and seminars scheduled on a quarterly basis).

D. Marketing effort to recruit additional state users.

E. Other support functions (update distributions maintenance, of system libraries, user meetings, etc.)

Proposed software enhancements are as follows.

A. Milestone reports (EIS/P&R) - summary reports to assist the user in evaluation of their emissions inventory file

B. AQDHS-II to AQDHS-II report program -- allows users the option of producing AQDHS-II format input from the AQDHS-II report program (output normally in SAROAD format) for those local agencies who must report to the state agency in AQDHS-II format

C. Site Code File Expansion (AQDHS-II) -- include county codes, UTM coordinates, AQCR numbers and other fields as part of file

D. Parameter Code File Expansion (AQDHS-II) -- expand file to include a conversion factor to convert headings for that parameter file to standard units

E. Parameter Standards File (AQDHS-II) -- change file to contain standards in a set format

3.4 Summary

The proposed two-year plan was developed to optimally benefit both the state users and EPA. The resource allocation for the first year in the software development reflects a larger resource requirement than initially scheduled by EPA. SRD feels, however, that such software enhancements are an absolute necessity if EPA is to be sucessful in recruiting a significant number of the non-CDHS agencies currently outstanding. Such user-oriented enticements must be implemented and then advertised among potential users.

It should be noted that though the programming effort proposed for the second year contains only five identifiable enhancements, the total number which requires development during fiscal year 1979 will substantially increase as a result of user requests and troubleshooting activities.

STATE COMPUTER SYSTEM SURVEY

REGION	STATE	MAKE	MODEL	CORE	NO. of TAPES	(1) COMPILER	(2) USAGE	ADEQUATE TIME E	ADEQUATE TIME A	INSTALLATION SYSTEM (5) E	INSTALLATION SYSTEM (5) A
I	Connecticut	IBM	370/165	3M	NR	C,F	EI,AQ	Y	Y	O	A
	Rhode Island	IBM	370/158(4)	NR	4	C,F	AQ	Y	Y	-	A
	Maine	Honeywell	6000	256K	12	C,F	AQ	Y	Y	-	-
	Massachusetts	CDC	CYBER 72	93K words	4	C,F	EI,AQ	Y	Y	E	A
	New Hampshire	Honeywell	6066	256K words	11	C,F	AQ	N	Y	-	A
	Vermont	IBM	370/145	NR	NR	C,F		Y	NR	O	-
II	Puerto Rico	IBM	370/155	700K	6	C,F	EI,AQ	Y	Y	E	A
	New York	IBM	370/155	500K	NR	C,F	EI	Y	N	O	-
		Burroughs	3500	150K	4	(3)	AQ	N	Y	-	O
	New Jersey	IBM	370/145	750K	NR	C,F	EI,AQ	Y	Y	E	-
	Virgin Islands	No computer								-	-
III	Delaware	IBM	360/50	512K	NR	C,	EI	Y	N	E	-
	Maryland	IBM	370/155(4)	NR	NR	C,F		Y	Y	O	O
	Pennsylvania	UNIVAC	1110	NR	NR	C,F		Y	Y	O	O
	Virginia	IBM	370/158	2M	NR	C,F	EI,AQ	Y	Y	E	A
	W. Virginia	IBM	360 or 370(4)	NR	NR	C,F		N	N	-	-
	Dist. of Columbia	NR								-	-
IV	Alabama	UNIVAC	1110	NR	NR	C,F	AQ	N	Y	-	A
	Florida	UNIVAC	1100/40	256K words	6	C,F	AQ	Y	Y	O	A
	Georgia	UNIVAC	1110	262K	8	C,F	AQ	Y	Y	E	A
	Kentucky	IBM	370	NR	NR	C,F	EI,AQ	Y	Y	E	O
	Mississippi	IBM	370/155	2M	NR	C,F	EI	Y	Y	E	O
	North Carolina	IBM	NR	NR	NR	C,F	EI	Y	Y	E	O
	South Carolina	IBM	370/158(4)	2M	12	C,F	EI,AQ	Y	Y	E	A
	Tennessee	IBM	NR	NR	NR	C,F	EI,AQ	Y	Y	E	A
V	Illinois	IBM	370/165	NR	20	C,F	EI,AQ	Y	Y	O	A
	Michigan	IBM	370/155	75K	12	C,F	EI	Y	Y	O	-
		CDC	6500	96K	4	C,F	AQ	Y	Y	-	O
	Wisconsin	UNIVAC	9400	64K	2	F	EI,AQ	Y	Y	-	O
	Minnesota	CDC	3300	230K	4	C,F	EI,AQ	Y	Y	E	O
	Ohio	IBM	370/158	2M	20	C,F	AQ	Y	Y	E	O
	Indiana	IBM	370/165	5M	NR	C,F	EI,AQ	Y	Y	E	A
VI	Arkansas	Digital Eq. Corp	Deck 10	64K	Tape & Disk	C,F		N	N	-	-
	Texas	UNIVAC	1106	262K	6	C,F	EI,AQ	Y	Y	O	O
	Oklahoma	IBM	370/145	NR	NR	C,F	AQ	Y	Y	-	A
	Louisiana	IBM	370/155	NR	NR	C,F	EI,AQ	N	N	-	-
	New Mexico	IBM	370/158	NR	3	C,F	EI,AQ	Y	Y	-	O
VII	Missouri	IBM	370/155	NR	NR	C,F	EI,AQ	Y	Y	E	A
	Nebraska	IBM	370/158	NR	NR	C,F	EI,AQ	Y	Y	O	O
	Iowa	IBM	370	86K	4	C,F	EI	Y	Y	O	A
	Kansas	IBM	370/158	NR	NR	C,F	EI,AQ	Y	Y	O	O
VIII	Colorado	IBM	370/145	1M	NR	C,F	EI,AQ	Y	Y	E	A
	Montana	IBM	370/145	NR	NR	C	EI	Y	Y	E	O
	North Dakota	IBM	370/145	1M	NR	C,F	EI,AQ	Y	Y	E	A
	South Dakota	IBM	370/158	NR	NR	C,F				-	-
	Utah	IBM	370/158	NR	NR	C,F		N	N	-	-
	Wyoming	IBM	370/155	NR	NR	C,F	AQ	N	Y	-	A
IX	Arizona	Honeywell	6000	NR	NR	C,F	EI,AQ	Y	Y	E	A
	California	CDC	3300	96K	6	C,F	AQ	Y	Y	E	A
	Nevada	UNIVAC	1108(4)	256KW	NR	C,F	AQ	Y	Y	-	A
	Hawaii	No computer						N	N	-	-
	Guam	No computer						N	N	-	-
	Samoa	NR								-	-
X	Alaska	IBM	370/145(DOS)	212K	4	C,F	EI,AQ	Y	Y	E	A
	Idaho	IBM	370/155	2M	5	C,F		N	N	-	-
	Oregon	IBM	370/158	560K	2M	C,F		Y	Y	O	O
	Washington	2 IBM	370/158	2M	14	C,F		Y	Y	O	O

(1) C indicates ANSI COBOL compiler available
F indicates ANSI FORTRAN compiler available

(2) EI indicates computer may be used to support the emission inventory
AQ indicates computer may be used to support the air quality system

(3) Does not have ANSI compilers

(4) Computer time is rented commercially

(5) O - own system, including STARTER, Old AQDHS: A = AQDHS, including contractor operated and COMNET installations; E = EIS, including contractor operated and COMNET installations; - = no automatic system

(6) NR indicates no reported information